

What is claimed is:

1. A training method for athletes, comprising the steps of:
positioning portions of the athlete's body on both sides of a joint in a
5 three point stabilization system;
centering an axis of rotation of the joint with an axis of rotation of an
actuator;
sequentially performing acceleration training on the joint
supramaximally against the actuator through a sports specific motion; and
10 sequentially performing stretch-shortening cycle training on the joint
supramaximally against the actuator through a sports specific motion.
2. The method of claim 1 wherein the step of sequentially
performing acceleration training supramaximally comprises the step of training
15 against a hydraulic resistance using a sports specific motion.
3. The method of claim 1 wherein the step of sequentially
performing acceleration training supramaximally comprises the step of training
against a rotary hydraulic resistance using a sports specific motion.
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4. The method of claim 1 wherein the step of sequentially
performing stretch-shortening cycle training of the joint supramaximally comprises
the step of training against isotonic resistance using a sports specific motion.
- 25 5. The method of claim 1 wherein the step of sequentially
training the joint supramaximally using a sports specific motion comprises the step
of sequentially training the joint supramaximally using a combination of isotonic
and hydraulic resistance.

6. The method of claim 1 wherein the step of applying a stabilizing harness to the athlete.

5 7. The method of claim 6 wherein the step of applying the stabilizing harness to the athlete further comprises the step of applying shoulder straps to the athlete.

8. The method of claim 6 wherein the step of applying the
10 stabilizing harness to the athlete further comprises the step of applying a waist strap to the athlete.

9. The method of claim 1 wherein the step of supramaximally training the joint comprises the step of progressively increasing the load on the
15 actuator.

10. The method of claim 1 wherein the step of supramaximally training the joint comprises the step of achieving maximum joint speed.

20 11. The method of claim 1 wherein the step of positioning portions of the athlete's body on both sides of the joint in a three point stabilization system comprises the steps of:

engaging at a first contact point a portion of the athlete's body with the actuator distal to the axis of rotation of the joint;

25 supporting at a second contact point a portion of the athlete's body at or near the axis of rotation and on the opposite side of the limb as the first contact point; and

supporting at a third contact point a portion of the athlete's body

proximal the axis of rotation and on the same side as the first contact point.

12. The method of claim 1 wherein the joint is selected from one of the wrist, elbow, shoulder, waist, neck, ankle, knee or hip.

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13. The method of claim 1 wherein the step of sequentially performing acceleration training comprises performing acceleration training concentrically.

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14. The method of claim 1 wherein the step of sequentially performing stretch-shortening cycle training comprises rapidly converting an eccentric contraction to a concentric contraction.

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15. A training apparatus for athletes, comprising:
a three point stabilization system adapted to isolate and stabilize portions of the athlete's body on both sides of a joint;
an actuator having an axis of rotation centered at an axis of rotation of the joint;
a first resistance device adapted to perform acceleration training on the joint supramaximally against the actuator through a sports specific motion; and
a second resistance device adapted to perform stretch-shortening cycle training on the joint supramaximally against the actuator through a sports specific motion.

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16. The apparatus of claim 15 wherein the first resistance device is hydraulic.

17. The apparatus of claim 15 wherein the first resistance device is

a circular hydraulic device.

18. The apparatus of claim 15 wherein the second resistance device is isotonic.

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19. The apparatus of claim 15 wherein the first and second resistance devices can be coupled to the actuator simultaneously.

20. The apparatus of claim 15 comprising a stabilizing harness.

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21. The apparatus of claim 20 wherein the stabilizing harness comprises one or more shoulder straps.

22. The apparatus of claim 20 wherein the stabilizing harness comprises one or more waist straps.

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23. The apparatus of claim 15 wherein the three point stabilization system comprises:

a first contact point on the actuator adapted to engage with a portion of the athlete's body distal to the axis of rotation of the joint;

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a second contact point adapted to engage with a portion of the athlete's body at or near the axis of rotation of the joint and on the opposite side of the athlete's body as the first contact point; and

a third contact point adapted to engage with a portion of the athlete's body proximal the axis of rotation of the joint and on the same side as the first contact point.

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24. The apparatus of claim 15 wherein the three point stabilization

system is adapted to isolate and stabilize one of the wrist joint, elbow joint, shoulder joint, waist, neck, ankle joint, knee joint or hip joint.

25. The apparatus of claim 15 wherein the first resistance
5 mechanism provides concentric resistance.

26. The apparatus of claim 15 wherein the second resistance
mechanism provides eccentric resistance.

10 27. The apparatus of claim 15 wherein the first and second
resistance devices comprises discrete resistance devices.

28. The apparatus of claim 15 comprising an adjustment
mechanism to center the axis of rotation of the actuator with the axis of rotation of
15 the joint.

29. The apparatus of claim 15 comprising one or more electronic
sensors adapted to provide feedback for one or more of force, range of motion,
acceleration, maximum velocity, and number or repetitions.
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